

Foraging habitat under Alternative A, no action

The BA, the Biological Assessment the FS and BLM completed on existing plans, found management direction generally lacking for foraging habitat – see Table 3-3.

Under the no-action alternative, management direction to conserve lynx would not be incorporated into the existing plans. Winter snowshoe hare habitat likely would decline both in quality and quantity.

Landscape patterns under Alternative A

Under Alternative A, wildfires would continue to be suppressed at current levels, removing fire as an ecosystem driver creating foraging habitat. In development allocations where timber sales are allowed, regeneration timber harvest is not likely to make up for removing fire because of other resource

considerations (Hillis et al. 2003).

In FS Region 1, less than 13 percent of the LAUs exceed 30 percent unsuitable habitat. All were caused by wildfires in 1988 and 2000. About 13 percent had more than 15 percent unsuitable (Hillis et al. 2003); timber harvest caused very few to exceed 15 percent unsuitable.

In some areas, it's possible for individual lynx to be affected because of the distribution of foraging habitat. Where large patches of unsuitable habitat have resulted from fire and timber harvest, these patches likely will become forage over time. Other places may lack both unsuitable and forage habitat because they lack disturbance. Existing plans don't include management direction to provide a distribution of lynx habitat conditions.

Table 3-3. BA findings about whether existing plans are adequate to protect winter snowshoe hare habitat

	<u>Fully or substantially</u>	<u>Marginally</u>	<u>Do not</u>	<u>Unknown or n/a</u>
FS plans (20 in amendment area)				
Fire management	30%	55%	15%	- - -
Landscape patterns	15%	70%	15%	- - -
Precommercial thinning	10%	55%	35%	- - -
Habitat conversions	5%	35%	60%	- - -
Foraging habitat	35%	65%	- - -	- - -
BLM plans (nine in amendment area)				
Fire management	- - -	11%	89%	- - -
Landscape patterns	- - -	22%	33%	45%
Precommercial thinning	- - -	33%	11%	56%
Habitat conversions	22%	33%	- - -	45%
Foraging habitat	- - -	11%	22%	67%

Fire management - Existing plans direct fire management to provide or improve lynx habitat

Landscape patterns - Existing plans results in landscape vegetation patterns suitable for lynx habitat

Precommercial thinning - Existing plans direct integrating lynx habitat needs in thinning projects

Habitat conversions - Existing plans prohibit conversions that reduce habitat suitability

Foraging habitat - Direction in existing plans would provide winter snowshoe hare habitat

Type conversions could occur and in some places reforestation could result in species that don't provide adequate winter cover for snowshoe hares.

Precommercial thinning under Alternative A

About 400,000 acres of lynx habitat may be ready for precommercial thinning during the next decade. It's unlikely funding would be available to thin all these acres. In the recent past – the five years before lynx were listed as threatened – an average of about 20,000 acres per year were funded both inside and outside lynx habitat.

Under Alternative A, all thinning funded would be allowed, reducing foraging habitat on thinned acres. Various studies have shown that thinning reduces snowshoe hare densities. Preliminary findings from research underway in Montana suggest precommercially thinned forests have lower snowshoe hare densities than unthinned forests (Hodges and Griffin, pers. com.)

For more information about thinning, see the *Forests* section later in Chapter 3; for a discussion about how funding affects thinning, see the *Economics* section.

Fuel treatments under Alternative A

Fuel treatments would not be limited under Alternative A. Fuel treatments mostly take place in multistoried forests but also sometimes occur in young regenerating forests. They are likely to reduce winter snowshoe hare habitat if they reduce the density of small trees. During the next decade, 540,000 acres of fuel treatment are projected for Montana. Some of these acres would be inside lynx habitat – see the *Fire* section.

An analysis using Montana FIA and fuel treatment data was conducted to approximate the potential effects – see Table 3-4 and the discussion in the summary for effects of Alternative A.

Other vegetation management under Alternative A

Other vegetation management activities could occur in multistoried winter snowshoe hare habitat, such as using prescribed burning to restore whitebark pine. In some whitebark pine forests, understory trees may need to be removed before burning. During the next decade, about 50,000 acres of whitebark pine restoration could occur without using precommercial thinning. See the *Forests* and *Plants* sections later in Chapter 3.

Timber harvest could also affect foraging habitat, but how many acres might be affected is not known. See the *Forests* for a description of the kinds of management actions that take place.

Where such activities remove foraging habitat, that would be detrimental to lynx; where foraging habitat is maintained or prolonged, that would be beneficial. Under Alternative A, no changes would be made to incorporate management direction to prolong or protect winter snowshoe hare habitat.

Grazing under Alternative A

About 1,700 active grazing allotments overlap lynx habitat in the amendment area. About 15 percent lack management strategies that result in habitat conditions favorable for lynx. Under Alternative A, grazing on these almost 250 allotments may reduce hare foraging habitat in aspen, willows and riparian areas, or in

shrub-steppe areas, which could reduce localized habitat conditions favorable for lynx.

Summary of effects on foraging habitat under Alternative A

To evaluate the combined effects of precommercial thinning, fuel treatments and whitebark pine restoration, an analysis was done for Montana. Only Montana was included because FIA data was readily available only for this state.

The effects on foraging habitat in the other amendment-area states are likely to be similar to Montana's.

Alternative A could reduce high-density winter snowshoe hare habitat by 14 percent if all activities are fully funded – see Table 3-4. If both high- and low-density habitat were considered, then only nine percent would be affected because there are more acres unaffected.

Table 3-4. Montana hare forage affected under Alternative A in a decade with full funding

	<u>High density</u> <u>2,353,000 acres</u>	<u>Low density</u> <u>1,767,000 acres</u>	<u>Total</u> <u>4,120,000 acres</u>
Precommercial thinning	213,000 acres	0	213,000 acres
Fuel treatment	65,000 acres	55,000 acres	120,000 acres
Whitebark pine restoration	40,000 acres	0	40,000 acres
No treatment	2,035,000 acres	1,712,000 acres	3,747,000 acres
Percent winter snowshoe hare habitat treated	14% ¹	3% ²	9% ³
Timber harvest	Unknown – some detrimental, some beneficial	Same	Same
Grazing	0	Some hare forage could potentially be reduced in local areas on 250 allotments	Same

Montana acres only

¹ 213,000 + 65,000 + 40,000 / 2,353,000 acres high density = 14%

² 55,000 / 1,767,000 acres low density = 3%

³ 213,000 + 120,000 + 40,000 / 4,120,000 acres total = 9%

Assumptions

Precommercial thinning and whitebark pine restoration would occur only in high-density winter snowshoe hare habitat and would be fully funded

Fuel treatment would occur in proportion to the amount of forested habitat

Other information

About 213,000 of the 400,000 acres of precommercial thinning scheduled in winter snowshoe hare habitat in the amendment area, are in Montana.

About 120,000 of the 540,000 acres of fuel treatment projected for the next decade in Montana, would occur in high or low density winter snowshoe hare habitat

About 40,000 of the 50,000 acres of whitebark pine restoration scheduled in the amendment area are in Montana

Precommercial thinning may result in the greatest effect since almost a quarter¹ of the high-density young forests would be thinned at full funding.

These estimates are likely high because in the recent past, precommercial thinning has been funded only about 34 percent

¹ 213,000 / 900,000 high density young forests = 24%

(see the *Economics* section) and because fuel treatments in lynx habitat may not occur to the extent predicted. In lynx habitat, many of the forests have not missed a fire cycle, so even though they are subject to crown fires, fewer fuel treatments may occur. It's likely the priority for fuel treatments would be outside lynx habitat – see the *Fire* section later in Chapter 3.

Foraging habitat under Alternative B

Alternative B would add management direction to existing plans promoting winter snowshoe hare habitat. Table 2-1 in Chapter 2 contains the full text.

- ♦ Objectives VEG O1, VEG O2, VEG O3, VEG O4 and GRAZ O1 support emulating historic disturbances that would create and maintain foraging habitat.
- ♦ Standards VEG S1, VEG S2, VEG S5, VEG S6, GRAZ S1, GRAZ S2, GRAZ S3 and GRAZ S4 are discussed below.
- ♦ Guideline VEG G1 emphasizes considering creating more foraging habitat where it's lacking.

Landscape patterns under Alternative B

Objective VEG O1 describes managing vegetation similar to historic disturbance processes. Objective VEG O3 describes conducting fire use activities to restore ecological processes and maintain or improve lynx habitat. Objective VEG O4 describes designing regeneration harvest and reforestation to develop characteristics suitable for winter snowshoe hare habitat.

Standards VEG S1 and VEG S2 limit how much lynx habitat in an LAU can be made unsuitable by vegetation management. The overall limit is 30 percent; timber harvest is limited to 15 percent in a decade. Under Alternative B, these standards could limit prescribed fire and timber harvest at the scale of an LAU.

They would help provide an even flow of winter snowshoe hare habitat over time.

Alternative B also includes Guideline VEG G1 that encourages creating winter snowshoe hare habitat where it's lacking.

Precommercial thinning under Alternative B
Standards VEG S5 and VEG S6 would defer precommercial thinning while forests provide foraging habitat.

Under Alternative B, precommercial thinning could be deferred on as much as 20,000 acres a year, given historic average funding (see the *Economics* section later in Chapter 3). The dense stands would continue to provide foraging habitat.

During the next decade, precommercial thinning would be allowed on an estimated 2,200 acres within 200 feet of buildings – see Table 3-5. This is likely to have a negligible effect on lynx because of the small, scattered acreage and its proximity to human activity.

Fuel treatments under Alternative B

While forests are providing foraging habitat, Alternative B would restrict fuel treatments done by precommercial or understory thinning. Prescribed burning or timber harvest could be used to reduce fuels because they are not specifically prohibited.

Other vegetation management under Alternative B

Alternative B does not restrict timber harvest from removing foraging habitat.

Table 3-5. Lynx habitat that could be thinned next decade under Alternative B

<u>Precommercial thinning</u>	<u>Acres winter snowshoe hare habitat</u>
Within 200 feet of administrative sites, dwellings or outbuildings	2,190 acres

Some foraging habitat could be lost depending on project design, but how much is not known. Projects could be beneficial in multistoried forests if they prolonged or maintained the small trees and brush that constitute hare habitat, but detrimental if they removed the undergrowth.

Grazing under Alternative B

Standards GRAZ S1, GRAZ S2, GRAZ S3 and GRAZ S4 would make sure livestock grazing in lynx habitat was managed in ways that make it possible for trees, shrubs and aspen to regenerate. Shrub-steppe habitat and riparian areas would be managed similar to historic conditions, helping maintain and provide foraging habitat and cover.

Summary of effects on foraging habitat under Alternative B

On Montana NFs, Alternative B could result in a three percent reduction of high-density forage habitat if all activities were fully funded – see Table 3-6.

However, it's likely this estimate is high because fewer fuel treatments probably would occur because many forests in lynx habitat have not missed a fire cycle. The priority for fuel treatments is likely to be in forests that have missed at least one fire cycle.

Only a limited amount of precommercial thinning in young regenerating forests would be allowed under Alternative B, so that activity would have a limited effect.

Table 3-6. Montana hare forage affected under Alternative B in a decade with full funding

	<u>High density</u> <u>2,353,000 acres</u>	<u>Low density</u> <u>1,767,000 acres</u>	<u>Total</u> <u>4,120,000 acres</u>
Precommercial thinning	1,000 acres	0	1,000 acres
Fuel treatment	33,000 acres	27,000 acres	60,000 acres
Whitebark pine restoration	40,000 acres	0	40,000 acres
No treatment	2,279,000 acres	1,740,000 acres	4,019,000 acres
Percent winter snowshoe hare habitat treated	3% ¹	1% ²	2% ³
Timber harvest	Unknown – some detrimental, some beneficial	Same	Same
Grazing	No effect	No effect	No effect
¹ 1,000 + 33,000 + 40,000 / 2,353,000 = 3% ² 27,000 / 1,767,000 = 1% ³ 1,000 + 60,000 + 40,000 / 4,120,000 = 2%			

Assumptions

Whitebark pine restoration would occur only in high-density winter snowshoe hare habitat.

Only half as many fuel treatments would occur as under Alternative A, because prescribed burning or commercial timber harvest would be the only tools available – understory and precommercial thinning would not be allowed

Fuel treatments would be fully funded

Other information

About 1,000 of the 2,190 acres of precommercial thinning scheduled in lynx habitat are in Montana

Foraging habitat under Alternative C

Alternative C would add the same management direction as the Proposed Action, except:

- ♦ Standards VEG S1, VEG S5 and VEG S6 are changed as discussed below
- ♦ Standard VEG S2 is replaced by Guideline VEG G6

Landscape patterns under Alternative C

Standard VEG S1 would increase the size of area to which the 30 percent unsuitable habitat limit was applied, to an LAU or a fixed combination of adjacent LAUs.

Fire has been documented to occur in the amendment area at scales many times larger than a single LAU or even multiple LAUs (Hillis et al. 2003). The LCAS identified historic fire disturbance patterns as a desired condition of lynx habitat. Expanding the size of the area would allow projects that more closely reflect historic fire disturbance patterns.

Compared to Alternative B, it's possible individual lynx would more likely be affected by expanding the size of area, because an LAU may have large patches of unsuitable habitat. However, because the multiple-LAU scale comes closer to historic disturbance patterns than a single LAU, Alternative C may provide greater benefits to lynx populations as a whole over the long term.

Standard VEG S2 would be changed to Guideline VEG G6. The amount of timber harvest resulting in unsuitable habitat during a decade would have to be considered, but not limited if justified by other needs. In FS Region 1, timber harvest has resulted in more than 15 percent unsuitable habitat in 13 percent of the LAUs (Hillis et al. 2003). The change to a guideline is likely to have limited effect.

Guideline VEG G1, encouraging projects that create or extend forage habitat, is changed to target the stem exclusion stage, which has little or no value for snowshoe hares.

Vegetation management under Alternative C
Alternative C modifies Standards VEG S5 and VEG S6 to apply to all vegetation management projects not just precommercial thinning. The only projects allowed would be research, genetic tree tests and within 200 feet of buildings.

In young regenerating forests, precommercial thinning would most likely be the activity restricted because few other vegetation management projects occur. About 4,000 acres of precommercial thinning during the next decade would be allowed, affecting less than one-half of one percent² of the winter snowshoe hare habitat – see Table 3-7.

Table 3-7. Lynx habitat that could be thinned next decade under Alternative C

<u>Precommercial thinning</u>	<u>² 400,000 / 900 Acres winter snowshoe hare habitat .4%</u>
Research	1,450 acres
Genetic tree tests	220 acres
Within 200 feet of administrative sites, dwellings or outbuildings	2,190 acres
Total	3,860 acres

The effects on lynx are likely minimal because most projects would take place near some form of human habitation.

In multistoried forests, only research projects and precommercial thinning within 200 feet of buildings would be allowed. How many acres this amounts to is not known, but likely few.

Grazing under Alternative C

Grazing direction is the same as Alternative B, so the effects are the same.

Summary of effects on foraging habitat under Alternative C

In Montana NFs, Alternative C would reduce high-density winter snowshoe hare habitat at most by less than one percent – see Table 3-8. Alternative C generally would have beneficial effects on lynx in the short term because existing foraging habitat would not be reduced.

Habitat does not remain static over time – some kind of disturbance is needed to maintain the dense understory favorable for snowshoe hares in multistoried forests. Alternative C would depend more heavily on natural processes to do the job.

Table 3-8. Montana hare forage affected under Alternative C in a decade with full funding

	<u>High density</u> <u>2,353,000 acres</u>	<u>Low density</u> <u>1,767,000 acres</u>	<u>Total</u> <u>4,120,000 acres</u>
Precommercial thinning	3,000 acre	0	3,000 acres
Fuel treatment	0	0	0
Whitebark pine restoration	0	0	0
No treatment	2,350,000 acres†	1,767,000 acres	4,117,000 acres
Percent winter snowshoe hare habitat treated	Less than 1%	No effect	Less than 1%
Timber harvest	No effect	No effect	No effect
Grazing	No effect	No effect	No effect

Other information

About 3,000 of the 4,000 acres of precommercial thinning scheduled in lynx habitat are in Montana
No fuel treatments or whitebark pine restoration would take place in winter snowshoe hare habitat

Foraging habitat under Alternative D

Alternative D would add the same management direction as Alternative C, except the scale at which Standard VEG S1 would be applied is changed, and more activities are permitted under Standards VEG S5 and VEG S6.

Landscape patterns under Alternative D
Standard VEG S1 would further increase the size of the area to which the 30 percent unsuitable habitat limit is applied, to a sub-basin or isolated mountain range. This size of area is large enough to mimic large-scale historic disturbance patterns like large fires.

Under Alternative D, it's even more possible that individual lynx could be affected, because the distribution of foraging habitat over broad areas is more likely to fluctuate than under Alternatives B or C. Whole LAUs could end up unsuitable, similar to what may have happened under natural disturbance

patterns. However, because the sub-basin or isolated mountain range scale would allow historic disturbance patterns to be fully factored in, Alternative D may provide greater long-term benefits to lynx populations as a whole.

The requirement to restrict timber-harvest-created unsuitable habitat to 15 percent is dropped. Timber harvest has resulted in more than 15 percent unsuitable habitat in less than 13 percent of the LAUs in FS Region 1 (Hillis et al. 2003). It's unlikely extensive regeneration harvest would occur anyway because of concerns about other resources – so dropping this standard is likely to have a limited effect.

Precommercial thinning & other vegetation management under Alternative D
Standards VEG S5 and VEG S6 would allow some vegetation management projects that reduce foraging habitat.

Table 3-9. Lynx habitat that could be thinned next decade under Alternative D

<u>Precommercial thinning</u>	<u>Acres winter snowshoe hare habitat</u>
Research	1,450 acres
Genetic tree tests	220 acres
Within 200 feet of administrative sites, dwellings or outbuildings	2,190 acres
Aspen	3,050 acres
Whitebark pine	9,110 acres
Lodgepole pine	34,550 acres
<i>Subtotal</i>	<i>50,570 acres</i>
Daylight thinning where 80% of the cover is retained	
Planted western white pine	51,090 acres
Ponderosa pine	11,660 acres
Western larch	123,160 acres
<i>Subtotal daylight thinning only</i>	<i>186,000 acres</i>
Total	236,480 acres

20% snowshoe hare forage may be reduced on day light thinning acres = 20% of 186,000 = 37,200 acres
+ 50,570 acres traditional thinning = 87,770 acres where snowshoe hare forage may be reduced

In young regenerating forests, precommercial thinning would be allowed in the following situations:

- ♦ Research could be done
- ♦ Genetic tree tests could occur
- ♦ Vegetation could be thinned within 200 feet of administrative sites, dwellings and outbuildings
- ♦ Conifers could be thinned out around aspen
- ♦ Thinning and prescribed fire could be done to restore whitebark pine or to develop future old growth characteristics in lodgepole pine
- ♦ *Daylight thinning* – where the competitors are weeded out from around selected trees – could occur around western larch, ponderosa pine and planted rust-resistant western white pine if 80 percent of the hare forage is retained. Daylight thinning may have a less detrimental effect on snowshoe hares than traditional thinning since so much cover is retained, but it's unknown how hares will respond.

Forage is likely to be reduced somewhere from 87,000 to 236,480 acres during the next decade.

Retaining 80 percent of the cover in the 186,000 acres of daylight thinning may reduce the loss of foraging habitat. The worst-case scenario would be that winter snowshoe hare habitat would be greatly reduced on all thinned acres – see Table 3-9.

In multistoried forests, Alternative D would preclude most vegetation management. Projects could be done to restore western larch, ponderosa pine and planted white

pine where 80 percent of the cover is retained. Whitebark pine restoration projects also would be allowed.

Vegetation management projects could occur if it improved or maintained foraging habitat in the long term. Small openings could be created or mid-height trees removed so small trees and brush could grow. How many acres might be involved is unknown.

Grazing under Alternative D

Grazing direction is the same as Alternatives B and C, so the effects are the same.

Summary of effects on foraging habitat under Alternative D

On Montana NFs, Alternative D could result in a seven percent reduction of high-density winter snowshoe hare habitat and an overall reduction of about four percent – see Table 3-10.

Alternative D could reduce forage habitat in young regenerating forests by about 15 percent³ during the next decade. Since thinning reduces snowshoe hare habitat, any reduction may have an adverse effect on lynx. Whitebark pine restoration projects could reduce forage. In multistoried forests, projects that prolong or maintain forage habitat could have either no effect or a beneficial effect over time.

³ 139,000 / 900,000 high density young forests = 15%

Table 3-10. Montana hare forage affected under Alternative D in a decade with full funding

	<u>High density</u> <u>2,353,000 acres</u>	<u>Low density</u> <u>1,767,000 acres</u>	<u>Total</u> <u>4,120,000 acres</u>
Precommercial thinning	139,000 acres	0	139,000 acres
Fuel treatment	0	0	0
Whitebark pine restoration	40,000 acres	0	40,000 acres
No treatment	2,195,000 acres	1,767,000 acres	3,962,000 acres
Percent winter snowshoe hare habitat treated	8% ¹	0	4% ²
Timber harvest	Limited – must maintain or improve forage over long term	Same	Same
Grazing	No effect	No effect	No effect

$$^1 139,000 + 40,000 / 2,353,000 = 8\%$$

$$^2 139,000 + 40,000 / 4,120,000 = 4\%$$

Other information

No fuel treatments would occur

About 139,000 of the 236,500 acres of precommercial thinning allowed are in Montana

About 40,000 of the 50,000 acres of whitebark pine restoration are in Montana

Foraging habitat under Alternative E

Landscape patterns under Alternative E

Alternative E has the same objectives as Alternative B, and Guideline VEG G1 is the same as under Alternative C.

Standard VEG S1 would apply the 30 percent unsuitable habitat limit to an LAU or a fixed combination of adjacent LAUs, the same as in Alternative C. Alternative E would not limit fuel treatment projects that may make lynx habitat unsuitable. Fuel treatment may proceed even if an LAU already exceeds 30 percent unsuitable. Since this situation describes only a few LAUs and they're recently burned areas, they're unlikely to need fuel treatment in the near future.

Vegetation management under Alternative E

Under Alternative E, Standard VEG S5 only limits precommercial thinning, as in Alternative B, not all vegetation projects, as in Alternatives C and D. Alternative E would allow precommercial thinning projects in young regenerating forests for fuel treatment, research, genetic tree tests and within 200 feet of buildings. About 4,000 acres could be precommercially thinned – see Table 3-11.

Since precommercial thinning is the primary activity in young regenerating forests there are likely to be few other

effects to these forests caused by other vegetative management.

Under Alternative E, Standard VEG S6 is replaced by a less restrictive guideline, Guideline VEG G8. Winter snowshoe hare habitat in multistory forests would have to be considered when designing projects, but the projects could remove forage habitat when justified by other needs.

It's assumed fuel treatments would proceed in winter snowshoe hare habitat because of the need to reduce hazardous fuels and would reduce about four percent of winter snowshoe hare habitat.

Grazing under Alternative E

Grazing direction is replaced with a less restrictive guideline under Alternative E. If the guideline is not followed in some areas then potential snowshoe hare habitat could be reduced which may affect an individual lynx. However, there is no information that grazing poses a threat to lynx populations (USDI FWS, 2003); therefore the effects would only be localized and would not affect the population as a whole.

Table 3-11. Lynx habitat that could be thinned next decade under Alternative E

<u>Precommercial thinning</u>	<u>Acres of winter snowshoe hare habitat</u>
Research	1,450 acres
Genetic tree tests	220 acres
Within 200 feet of administrative sites, dwellings or outbuildings	2,190 acres
Total	3,860 acres

Table 3-12. Montana hare forage affected under Alternative E in a decade with full funding

	<u>High density</u> <u>2,353,000 acres</u>	<u>Low density</u> <u>1,767,000 acres</u>	<u>Total</u> <u>4,120,000 acres</u>
Precommercial thinning	3,000 acres	0	3,000 acres
Fuel treatment	65,000 acres	55,000 acres	120,000 acres
Whitebark pine restoration	40,000 acres	0	40,000 acres
No treatment	2,245,000 acres	1,712,000 acres	3,957,000 acres
Percent winter snowshoe hare habitat treated	5% ¹	3% ²	4% ³
Timber harvest	Limited – must maintain or improve forage over long term	Same	Same
Grazing	Limited localized effect	Limited localized effect	Limited localized effect

$$^1 3,000 + 65,000 + 40,000 / 2,353,000 = 5\%$$

$$^2 55,000 / 1,767,000 = 3\%$$

$$^3 3,000 + 120,000 + 40,000 / 4,120,000 = 4\%$$

Other information

About 3,000 of the 4,000 acres of precommercial thinning scheduled in lynx habitat are in Montana

All fuel treatment projected to occur in high and low density winter snowshoe hare habitat would take place

Whitebark pine restoration would take place

40,000 of the 50,000 acres of whitebark pine restoration scheduled are in Montana

Summary of effects on foraging habitat under Alternative E

On Montana NFs, Alternative E could result in a five percent reduction of high-density winter snowshoe hare habitat and an overall reduction of four percent – see Table 3-12. Alternative E would have only a limited effect on young regenerating

forests since most precommercial thinning is precluded and fuel treatments are not likely.

In multistoried forests fuel treatments could reduce or eliminate winter snowshoe hare habitat on about 120,000 acres by removing the understory vegetation.

Denning habitat

Lynx productivity may also be affected by the availability of denning habitat.

Denning habitat consists of the woody debris in which lynx make their dens – root wads, wind-thrown piles or large down trees. It's used for birthing and rearing kittens. The debris protects the kittens from predators and from weather.

For denning habitat to be useful to lynx, it generally needs to be in or near foraging habitat. Because kittens are not very mobile early on, and the mother has to hunt to feed herself and her kittens, the juxtaposition of denning and foraging habitat is especially important.

Where denning habitat occurs

Denning sites may be found in regenerating forests disturbed at least 20 years ago and in older forests (Slough 1999) and young forests with residual dead and down trees (Squires, pers. com.). In northwest Montana, most dens are under a deadfall of large trees, but smaller logs are also used for dens when jack-strawed or in piles (Squires, pers. com.).

The important component for all lynx den sites appears to be the amount of down woody debris present, not the age of the forest (Mowat et al. 2000, USDI FWS, 2003)

No quantitative assessment is available of the amount and distribution of woody

material in the amendment area. Denning habitat is evaluated based on site-specific information available at the project level.

The BA found that generally denning habitat is likely not a limiting factor in the amendment area because most existing plans include direction to provide for old growth or retain dead and down material (Hickenbottom et al. 1999). Plans for the Ashley, Bighorn and Deerlodge NF's and the BLM lands include no such direction.

Denning habitat risks

Anything that reduces the density of woody debris in lynx habitat may constitute a risk to denning habitat. Losing denning habitat may affect the survival of kittens.

Risks to denning habitat include logging and fire. Prescribed fires and timber harvest remove woody material and may affect what's available. Salvage logging in particular removes denning habitat and potential denning habitat because it removes dead and down trees.

Denning habitat under Alternative A, no action

Most existing plans contain provisions to retain dead-and-down woody material or to maintain old growth habitat, which the BA deemed adequate to meet lynx denning needs (Hickenbottom et al. 1999).

For those units whose plans contain either very limited, incidental or no direction, denning habitat could be reduced under

Table 3-13. BA findings about whether existing plans provide for denning habitat

	<u>Fully or substantially</u>	<u>Marginally</u>	<u>Does not</u>	<u>Unknown or n/a</u>
Twenty FS plans	80%	10%	10%	- - -
Nine BLM plans	- - -	11%	33%	56%

Alternative A, so successful reproduction and kitten survival could be affected.

Under the no-action alternative, management direction to conserve lynx would not be incorporated into existing plans. Adequate denning habitat would be available on units with old growth or dead and down direction, and likely not available where such direction is lacking.

Denning habitat under Alternative B

Alternative B would add management direction to provide denning habitat.

- ♦ Objective VEG O2 says foraging habitat should be next to denning habitat
- ♦ Standards VEG S3 and VEG S4 are discussed below
- ♦ Guidelines VEG G2, VEG G3 and HU G1 emphasize locating foraging habitat near denning habitat, retaining denning habitat where it's unlikely to be consumed by stand-replacing fire and retaining woody debris when developing or expanding ski areas.

Standard VEG S3 requires ten percent denning habitat be provided in each LAU on lands capable of producing it, which would be beneficial for lynx.

Standard VEG S4 allows salvage logging in disturbed areas five acres or smaller only where public safety is at risk, such as in recreation sites or road or trail corridors. The area involved is likely to be small, and since the BA said denning habitat is probably not limiting in most of the amendment area, the effect on lynx of allowing this logging is likely negligible.

For plans lacking it, Alternative B would add management direction to provide for

denning habitat, increasing the likelihood that denning habitat would be available and distributed across all LAUs in the amendment area, which would be beneficial to lynx.

Denning habitat under Alternative C

Alternative C is similar to Alternative B except that Standard VEG S4 allows salvage logging within 200 feet of dwellings, as well as for public safety. Again, because the area involved is small and close to human habitation, the effect on lynx is likely negligible.

Alternative C would add management direction increasing the likelihood that denning habitat would be provided and distributed in lynx habitat across all LAUs in the amendment area, which would be beneficial to lynx.

Denning habitat under Alternatives D & E

Alternatives D and E modify Standard VEG S3 to say where ten percent denning habitat is not present, projects should avoid reducing it, or if they do reduce it, the effects will be mitigated. Mitigation may involve retaining standing dead trees and coarse woody debris to provide future denning sites, which would be beneficial to lynx.

Standard VEG S4 is changed to a guideline, so retaining dead trees in disturbed areas of five acres or smaller is no longer mandated, but would need to be considered.

Alternatives D and E would add management direction increasing the likelihood that denning habitat would be provided and distributed in lynx habitat across all LAUs in the amendment area,

which would be beneficial to lynx. These alternatives may result in some loss of denning habitat compared to Alternatives B and C, because the standard restricting salvage harvest is changed to a guideline.

Competition from other predators

Lynx have very large feet in relation to their body mass, providing them a competitive advantage over other carnivores in deep snow. Snow compaction may allow *competing carnivores* – primarily coyotes but also mountain lions and bobcats – winter access along compacted routes into lynx habitat, where they can hunt.

Where & how competition occurs

Snow conditions vary, both seasonally and from year to year. Periods of warm and windy weather may result in hardened snow. How long the crusted snow lasts depends on location, aspect, slope, and snowfall and temperature changes. Heavy snowfalls are frequent in the northern Rockies. Compacted snow may exist regularly only where people repeatedly compact it throughout the winter.

Various reports and observations have documented coyotes using high elevation areas with deep snow (Buskirk et al. 2000a). Coyotes use open areas because the snow is more compacted there, according to research conducted in central Alberta (Todd et al. 1981). Another study in Alberta showed coyotes selected hard or shallow snow more than lynx (Murray et al. 1994). A study in eastern Canada showed much less snowshoe hare activity

within 240 feet of repeatedly used snowmobile trails, with much more red fox activity (Neuman & Meriam 1972).

Related research is underway in northwestern Montana, northern Utah and north-central Washington – see Appendix F. Preliminary results from research in northwestern Montana indicates that coyotes and lynx are spatially segregated during the winter due to the availability of more abundant prey for coyotes (deer and road-killed deer) at lower elevations (Squires, pers. com. 2003). Preliminary results from studies in Utah indicate that coyotes access deep snow habitats that would otherwise be unavailable to them (Bunnell, pers. com. 2003).

At this time there is no evidence that, if competition exists between lynx and other predators, it exerts a population level threat on lynx (USDI FWS, 2003 p. 40097).

How competition may be affected by management activities

Competition risks from winter over-the-snow recreation

Winter recreation such as snowmobiling, cross-country skiing, dog-sledding and snow-shoeing compacts snow throughout the winter in some places, potentially increasing the access other predators have into lynx habitat (Halfpenney et al. 1999). These activities are increasing in lynx habitat – see the *Recreation* section later in Chapter 3.

About 13,000 miles of designated and groomed snowmobile and cross-country ski routes are in the amendment area. Of these, about 8,000 miles are in lynx

habitat. In the amendment area, there are 359 special use permits and agreements for winter activities, 94 percent in lynx habitat. These activities compact the snow and may provide access for competing predators to areas with deep snow.

Competition risks from mineral & energy development

Mining and energy development may change or eliminate lynx habitat, and can promote winter access. See the *Minerals* section later in Chapter 3. Access roads may be plowed during winter, improving access for competing predators into lynx habitat. These effects are likely to be localized since there is no information to indicate that mining or energy development poses a threat to lynx populations as a whole (USDI FWS 2000, USDI FWS, 2003).

Mineral materials (gravel, rock, sand)

About 2,600 active mineral materials pits exist in the amendment area. Of these, between two to three percent (from 50 to 80) are in lynx habitat. Pit size ranges from less than one acre up to five acres. Currently, only one has winter operations.

Locatable minerals (gold, silver, copper, etc.)

In the year 2000, 142 Plans of Operations and 550 Notices of Intent to operate were processed for the amendment area. During the last 15 years, about a third were inside lynx habitat. Most existing locatable minerals operations are less than 20 acres, although there are five operations in lynx habitat that are from 100 to 600 acres. The potential for mineral discovery in lynx habitat is considered low.

Leasable minerals

There are about 820,000 acres under lease for oil and gas, with more acres pending for lease in the amendment area. Only two wells have been drilled in lynx habitat during the past decade. Recent estimates suggest that eight more wells may be drilled. Currently, there are no pipelines in lynx habitat.

Competition risks from forest roads

Forest and backcountry roads and trails may make snow-compacting activities easier, which in turn may provide competing predators access into lynx habitat during the winter (Ruediger et al. 2000). See the *Roads* section later in Chapter 3.

Table 3-14. BA findings about whether existing plans manage snow-compacting activities

	<u>Fully or substantially</u>	<u>Marginally</u>	<u>Does not</u>	<u>Unknown or n/a</u>
FS plans (20 in amendment area)				
Winter recreation	15%	40%	40%	5%
Minerals	20%	55%	20%	- - -
Forest roads	60%	15%	25%	- - -
BLM plans (nine in amendment area)				
Winter recreation	22%	11%	67%	- - -
Minerals	- - -	- - -	100%	- - -
Forest roads	- - -	56%	44%	- - -

Competition under Alternative A, no action

Most existing plans contain limited direction about snow-compacting activities – see Table 3-14. Under the no-action alternative, management direction to conserve lynx would not be incorporated into existing plans. Existing land management direction would continue to be implemented.

Winter recreation under Alternative A

Existing management direction for over-the-snow winter recreation would continue. Grooming winter trails is likely to remain stable at current levels for at least the next five years because the amount of money for grooming is not likely to increase substantially. However, grooming may increase later in the decade to meet the continuing increase in demand if funding becomes available.

Public demand for outfitter services is likely to increase, and outfitter growth would likely follow current business trends. Outfitters have been diversifying their businesses by shifting their services to winter recreation, although the number of outfitters has remained stable during the last decade.

Existing uses may provide packed trails for other carnivores to more easily enter lynx habitat, and compete with lynx for food or prey on lynx. Under existing plans, grooming and designated routes could expand into new areas, providing additional access.

Mineral & energy development under Alternative A

There is limited mineral and energy development in lynx habitat. Access roads that are plowed in winter could also improve the access for competing predators.

Forest roads under Alternative A

About ten miles of road construction could occur in lynx habitat during the next few years – see Table 3-15. About five miles could be located on ridge-tops where lynx may travel. New road construction may provide new areas for over-the-snow winter recreation and may provide improved access to competing predators.

Competition under Alternative B

Alternative B would minimize potential risks to lynx from competing predators – see Table 2-1 in Chapter 2 for the complete text of the alternatives.

- ♦ Objective HU O1 would discourage new snow-compacting activities in lynx habitat.
- ♦ Standard HU S1 would limit increases in designated routes in an LAU.
- ♦ Standard HU S3 would restrict winter motorized access to designated routes for some activities
- ♦ Guidelines HU G4, HU G5 and HU G9 would encourage remote monitoring reclaiming sites, restricting access and decommissioning new roads

Table 3-15. Forest road management plans in lynx habitat in the amendment area

<u>Category of road</u>	<u>Miles</u>
Road construction planned during the next <i>five years</i> that could remain open	10
Roads planned on ridge tops that could remain open during the next <i>decade</i>	5

Winter recreation under Alternative B

Standard HU S1 says new routes could not be designated in an LAU, unless the designation would consolidate use and improve lynx habitat. Grooming could expand onto routes that are currently designated but not groomed. No restrictions are imposed for off-trail use.

Alternative B would limit the amount of man-caused snow compaction occurring in new areas. Standard HU S1 would limit the potential competition from other carnivores to existing areas.

Mineral & energy development under Alternative B

Standard HU S3 would restrict winter access for mineral and energy development to designated routes to help reduce snow compaction. Designating routes could benefit lynx by reducing the access competing predators have into lynx habitat.

Forest roads under Alternative B

Alternative B would provide guidance about what to consider during road construction to minimize or reduce the effects on lynx. Public access could be restricted on new roads, and new roads generally should not be built on ridge-tops.

Competition under Alternatives C & D

Alternatives C and D are similar to Alternative B for minerals and forest roads.

Winter recreation under Alternatives C and D

Standard HU S1 would increase the size of the area used to evaluate changes to groomed and designated routes, from a

single LAU, to an LAU or a fixed combination of adjacent LAUs. Standard HU S1 would allow groomed and designated routes to expand into areas that are already consistently used and compacted, as identified in the baseline of areas and routes used between 1998 and 2000.

Many existing snowmobile and cross-country ski routes traverse multiple LAUs. Managing larger route systems could consolidate use and provide a more effective way to reduce or eliminate effects on lynx, and may provide a greater beneficial effect on lynx populations as a whole. However, individual lynx may be affected.

Although expansion would be allowed, routes could expand only into areas already compacted, so there would be no net change in snow compaction in an LAU. This would allow for some expansion of groomed and designated routes, while maintaining the status quo on snow compaction.

Competition under Alternative E

Alternative E would change the management direction for over-the-snow use and mineral access from standards to less restrictive guidelines. This change could allow snow compacting activities in new areas potentially affecting individual lynx that use these sites. However, these effects are likely to be localized since there is no information to indicate that over-the-snow compaction poses a threat to lynx populations as a whole (USDI FWS 2000, USDI FWS, 2003).
